P-137

Two cases of pulmonary rehabilitation in lung cancer patients aged 80 and above

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Introduction

Pulmonary rehabilitation provided to lung cancer patients can be broadly categorized into two main types. Pre- and post-operative pulmonary rehabilitation aims to reduce surgical complications and facilitate swift recovery. Additionally, pulmonary rehabilitation before and after concomitant cheomo-radiation therapy can help patients maintain their physical function. This study aims to examine the clinical significance of pulmonary rehabilitation in two distinct scenarios: observing changes in physical function in elderly patients who underwent surgery and were followed up for five years, compared to elderly patients who underwent concomitant chemo-radiation therapy (CCRT) without surgery. Through observing these distinct cases, we seek to discuss the potential clinical implications of pulmonary rehabilitation in each situation.

Methods

The subjects of this study were two elderly male individuals in their eighties who were diagnosed with lung cancer. Their physical function records were examined to observe changes in physical function levels. Physical function was assessed through the six-minute walk test (6MWT) distance and respiratory muscle strength. Respiratory muscle strength includes maximal inspiratory pressure (MIP) and maximal expiratory pressure (MEP).

Results

The study revealed that while there was a general decline in physical function immediately following surgery, it gradually improved to a certain level with ongoing pulmonary rehabilitation. This level was then either maintained or further enhanced in the final assessment conducted after 3 to 5 years. Pulmonary rehabilitation services were found to be beneficial in maintaining the physical capacity for walking over 500 meters in 6 minutes even at the age of 80 or older. The second case involves a patient who was diagnosed with COPD after undergoing CCRT. Despite reaching the age of 80 and experiencing significant respiratory muscle weakness upon starting rehabilitation, the patient managed to maintain their physical function through regular outpatient visits. Although he required hospitalization for pneumonia treatment, he was able to maintain his walking ability. While his recent walking performance has slightly declined, he continue to engage in desired activities at home, resulting in high satisfaction levels among both the patient and family.

Table 1. Physical Function Evaluation Information for Case 1

	Date of evaluation	Age (years)	Height (cm)	Weight (kg)	6MWT (m)	MIP (cmH_20)	MEP (cmH_20)
Diagnosis	2018.03.23	75	Lung cancer (pleomorphic carcinoma, T3N0, stage IIB) HT/DM/Hepatitis/Tb -/-/-/-				
Operation	2018.04.11.	75	Left upper lobe lobectomy, wedge resection of Left lower lobe				
POD 9	2018.04.19	75		50.8	375	49	66
POD 34	2018.05.14	75		50.8	443	66	84
CTx	2018.05~08	75	Adjuvant vinorelbine / cisplatin				
POD 56	2018.06.05	75		52.5	465	83	87
POD 133	2018.08.21	75		55.5	481	61	100
POD 231	2018.11.27	75	164.1	58.6	540	79	108
POD 308	2019.02.12	76		58.9	534	85	94
POD 476	2019.07.30	76		59.3	536	90	102
POD 609	2019.12.10	77		59.6	571	80	93
POD 882	2020.09.08	78		56.6	521	81	97
POD 1770	2023.02.13	80		56	-	65	72

6MWT, six-minute walk test; MIP, maximal inspiratory pressure; MEP maximal expiratory pressure; HT, hypertension; DM, diabetes mellitus; Tb, tuberculosis; POD, post-operative day; CTx, chemotherapy

Table 2. Physical Function Evaluation Information for Case 2

	Date of evaluation	Age (years)	Height (cm)	Weight (kg)	6MWT (m)	MIP (cmH_20)	MEP (cmH_20)
Diagnosis	2017.10.19.	79	Small cell lung cancer Intracranial cerebral hemorrhage HT/DM/Hepatitis/Tb -/-/-/-				
CCRT	~2018.05	80	Seoul Asan medical center				
Co-Diagnosis	2018.12.06	80	COPD + pulmonary rehabilitation start ex-smoker, 40 PY, 20 YA				
PRD 1	2018.12.06	80		57.6	497	30	84
PRD 71	2019.02.14	81		58.7	438	36	98
PRD 133	2019.04.17	81		56.7	449	32	96
PRD 215	2019.07.08	81		58.2	425	61	122
PRD 412	2020.01.21	82	159.2	58.5	429	33	71
Admission	2020.02.22	82	Pneumonia (~2020.03.05)				
PRD 554	2020.06.11	82		57	438	54	86
PRD 806	2021.02.18	83		59.2	434	55	91
PRD 1156	2022.02.03	84		60	369	52	76

6MWT, six-minute walk test; MIP, maximal inspiratory pressure; MEP maximal expiratory pressure; HT, hypertension; DM, diabetes mellitus; Tb, tuberculosis; CCRT, concomitant cheomoradiation therapy; COPD, chronic obstructive pulmonary disease; PY, pack years; YA, years ago; PRD, post-rehabilitation day

Conclusion

These cases illustrate the potential of regular pulmonary rehabilitation in maintaining or improving physical function in elderly lung cancer patients aged 80 and above. Continuous and long-term pulmonary rehabilitation has been observed to prevent the decline in physical function, thus benefiting the elderly population and contributing to higher levels of self-satisfaction. Based on these experiences, it is believed that providing long-term rehabilitation programs for elderly lung cancer patients is necessary. However, further research examining the socioeconomic impact is needed to draw more definitive conclusions.

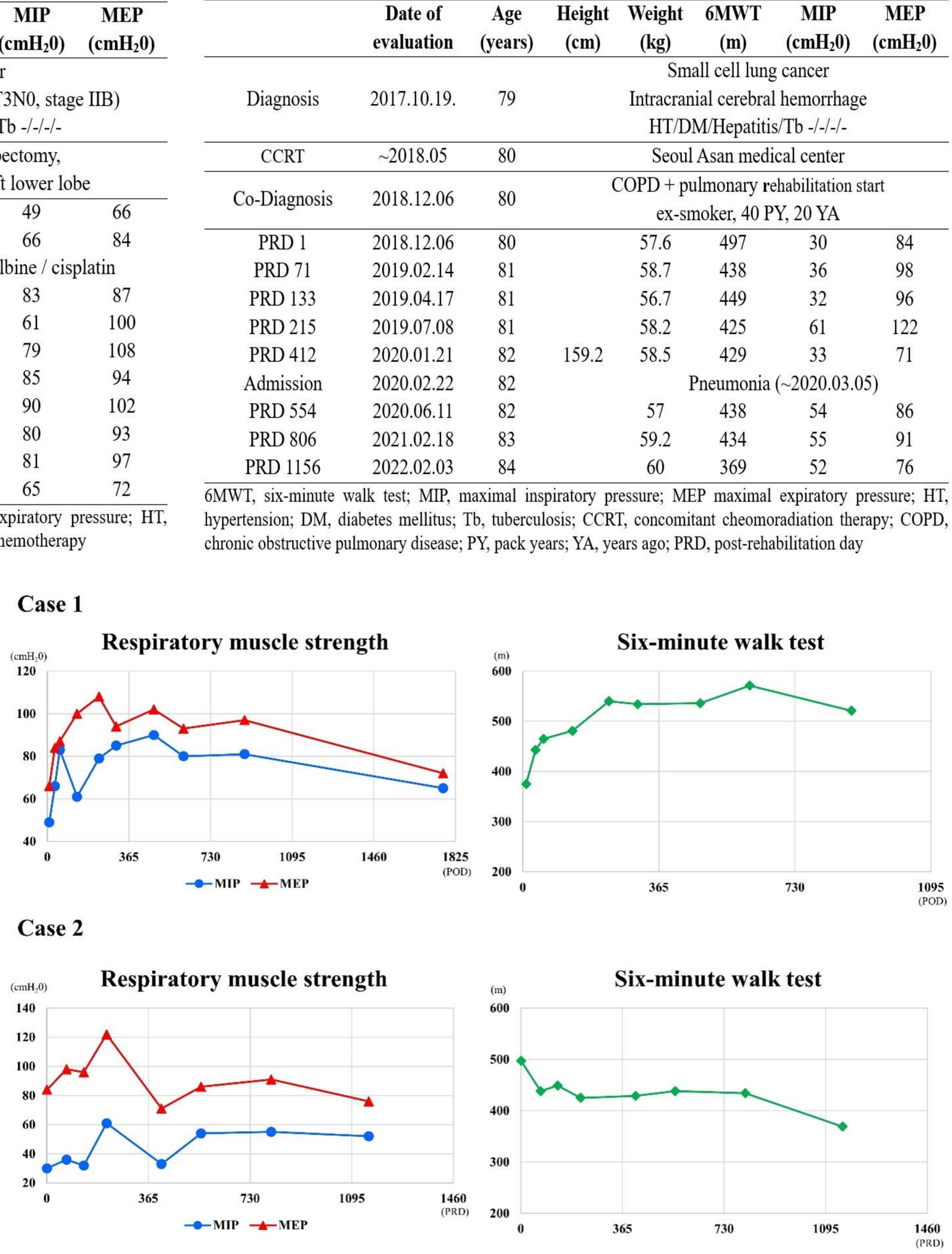

Fig 1. Trend Graph of Physical Function Data for Study Subjects